

Copper

Human Health Risk

Ecological Risk M - L

Socioeconomic Risk L

Copper is a metallic element with many industrial and consumer applications. Copper salts such as copper sulfate, are effective algicides that can be toxic to humans and wildlife at high doses. Copper sulfate is an odorless blue or green-white powder or solid that has been widely used to control algae in lakes, ponds, reservoirs, and irrigation systems. Direct application may result in a significant reduction in populations of aquatic life, including invertebrates, plants, and fish. Copper has a low toxicity for humans, although excessive levels in drinking water have resulted in mild symptoms including headaches, nausea, and diarrhea. Potential risks relate primarily to aquatic ecosystems, and a human health risk assessment was not conducted.

What's at risk?

Copper sulfate is very toxic to organisms that eat fish, and highly toxic to fish, amphibians, and crustaceans. The use of copper sulfate for temporary algae control can produce significant zooplankton mortality, and may also adversely affect trout, ornamental goldfish, and other sensitive fish in soft water. Soil organisms at industrial or hazardous waste sites are also at risk.

What are the ecological impacts in New Jersey?

In New Jersey the use of copper sulfate as an algicide has been on the rise since 1992. In addition, several hazardous waste sites contain copper concentrations above threshold values for ecological effects. The greatest impacts are to aquatic systems, due to its direct toxicity and indirectly because of oxygen depletion that results from the decay of large amounts of vegetation. Soil concentrations are below acceptable residential soil benchmarks, so effects on terrestrial systems are probably minimal. While copper continues to be ubiquitous in the environment, there is no evidence of substantial ecological impacts.

What are the socioeconomic impacts in New Jersey?

Costs associated with any copper-related illness appear to be minimal and there is little evidence that copper has enough of an adverse effect on ecosystems to threaten employment (in shellfish harvesting for example) or property values. There is also little reason to conclude that copper produces aesthetic impacts in New Jersey, or creates anxiety.

What's being done?

The use of copper sulfate has been regulated by the DEP Pesticide Control Program since 1989. Chelated copper products are available for use. These are less toxic to fish and aquatic invertebrates.